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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/529,877

10/16/2006

Yasuaki Takeuchi

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MCKENNA LONG & ALDRIDGE LLP  
1900 K STREET, NW  
WASHINGTON, DC 20006

EXAMINER

WALKER, KEITH D

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/529,877	<b>Applicant(s)</b> TAKEUCHI ET AL.	
	<b>Examiner</b> KEITH WALKER	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 13 January 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/1/05, 10/16/06, 8/4/08</u> .                                | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of Claims 1-3 & 5-13 in the reply filed on 1/13/10 is acknowledged. Claim 4 is withdrawn.

Claims 1-3 & 5-13 are pending examination as discussed below.

### ***Priority***

Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged.

### ***Information Disclosure Statement***

The information disclosure statements filed on 4/1/05, 10/16/06 & 8/4/08 have been placed in the application file and the information referred to therein has been considered as to the merits.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 2, 3 & 5-13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to

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which it pertains, or with which it is most nearly connected, to make and/or use the invention. The limitations directed to the intercalating of inorganic or organic ions/compounds is not described in the instant specification to enable one of ordinary skill in the art the ability to make the electrolytic membrane. The instant specification provides no examples illustrating how to intercalate the ions or compounds into the layered silicate minerals such that the solid electrolyte can be used as the electrolyte in a fuel cell application.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 2 & 3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The limitations drawn to the process of making the intercalation compounds by intercalating ions into the silicate material is indefinite because it is unclear if the ions are part of the final solid electrolyte membrane or just part of the process of making the solid electrolyte membrane. As best understood, in light of the instant specification, the claims will be interpreted to mean that the ions are not required in the final electrolyte product.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-3 & 5 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 02/015313 using US 6,844,097 (Fukuda) for the English translation and citations.

Fukuda teaches a fuel cell comprising an anode, a cathode and a solid electrolyte membrane comprising one kind of layered silicate minerals (Abstract; Fig. 1; 1:50-60, 2:25-30). The electrolytic membrane includes intercalated compounds and the electrodes have dispersed particles with electron conductivity and catalytic activity (2:60-3:5, 3:55-4:5).

4. Claims 1-3 & 5 are rejected under 35 U.S.C. 102(e) as being anticipated by US 2003/0054219 (Won).

Won teaches a fuel cell with an anode, a cathode and a solid electrolyte membrane comprising a layered silicate mineral. Inorganic and organic intercalated ions are used in the layered silicate mineral (Abstract; [0025-0027]). The solid electrolyte is used with a methanol based fuel cell to prevent fuel crossover. The anode and cathode inherently have electron conductive particles showing high catalytic activity.

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***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 02/015313 using US 6,844,097 (Fukuda) for the English translation and citations in view of US 4,505,992 (Dettling).

The teachings of Fukuda as discussed above are incorporated herein.

Fukuda teaches the fuel cell includes porous gas diffusion layers and separators for each of the anode and cathode (Fig. 1; 2:60-67).

Fukuda is silent to a water separator.

Dettling teaches a fuel cell stack with a water separator as a cooling plate (Abstract; Fig. 1; 5:40-50). The cooling plate maintains the proper temperature of the fuel cell stack.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the fuel cell of Fukuda with the water separator of Dettling to maintain proper fuel cell stack temperature.

Regarding the limitations to the type of fuel used to operate the fuel cell, these limitations are directed to the intended method of operating the fuel cell and do not further limit the physical structure of the claimed product. It is held that a recitation with

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respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus satisfying the claimed structural limitations (MPEP 2114). Furthermore, all of the claimed fuels are known fuels for the intended use with a fuel cell. Dettling also teaches using hydrogen containing fuels, including hydrogen itself, are well known (1:25-30, 5:10-15).

6. Claims 6-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2003/0054219 (Won) in view of WO 02/015313 using US 6,844,097 (Fukuda) for the English translation and citations and US 4,505,992 (Dettling).

The teachings of Won, Fukuda and Dettling as discussed above are incorporated herein.

Won is silent to a membrane electrode assembly having diffusion layers and a separator for each of the anode and cathode.

Fukuda teaches a membrane electrode assembly with diffusion layers and a separator for each of the anode and cathode to aid in distributing the reactants across the respective electrode (Fig. 1; 2:60-67).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the fuel cell of Won with the diffusion layers and separator layers of Fukuda to help in evenly distributing the reactants to the electrodes.

Won is silent to a water separator.

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Dettling teaches a fuel cell stack with a water separator as a cooling plate (Abstract; Fig. 1; 5:40-50). The cooling plate maintains the proper temperature of the fuel cell stack.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the fuel cell of Won with the water separator of Dettling to maintain proper fuel cell stack temperature.

Regarding the limitations to the type of fuel used to operate the fuel cell, these limitations are directed to the intended method of operating the fuel cell and do not further limit the physical structure of the claimed product. It is held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus satisfying the claimed structural limitations (MPEP 2114). Furthermore, all of the claimed fuels are known fuels for the intended use with a fuel cell. Dettling also teaches using hydrogen containing fuels, including hydrogen itself, are well known (1:25-30, 5:10-15).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Keith Walker whose telephone number is 571-272-3458. The examiner can normally be reached on Mon. - Fri. 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Keith Walker/  
Examiner, Art Unit 1795